

# Knowledge, Attitude, Practices, and Health Beliefs of Pregnant Women about Urinary Tract Infection and Its Associated Risk Factors: A Local Filipino Community Experience

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## Abstract

Urinary tract infection (UTI) during pregnancy is assumed to be associated with increased maternal and fetal morbidity and mortality; hence, a proper assessment of knowledge and practices is crucial to formulate preventive strategies to ensure the health of both the mother and the baby. The study determined the knowledge, attitude, practices (KAP), and the beliefs of pregnant women about UTI based on the Health Belief Model. A survey questionnaire was used to gather data from pregnant women with and without UTI. The association of the pregnant women's sociodemographic characteristics with their KAP and health beliefs was determined using Pearson's chi-square test. Results of the study showed that the majority of pregnant women have unsatisfactory knowledge with a positive attitude and good hygienic practices against UTI. Educational qualification and socioeconomic status showed a significant association with the KAP of pregnant women. Positive attitude and satisfactory hygienic practices were evident among the respondents despite their unsatisfactory knowledge. The salient traits of the Filipino women are exhibited on the descriptive of the Health Belief Model that include being resilient amid a problem and considering difficulties not as barriers but opportunities to make life healthier and better.

**Keywords:** Attitude, health belief model, knowledge, practices, urinary tract infection

## Introduction

Urinary tract infection (UTI) during pregnancy is related to increased risks of maternal and fetal mortality and morbidity, even if the infection is asymptomatic. The high rates of UTI in pregnancy also show high rates of preterm birth and fetal mortality. The mapping of UTI rates in pregnant women across different countries clearly shows that it is a global happening with median rates of 3% - 35%.<sup>1</sup> Women are likely to experience UTI than men, because of their short anatomical urethra, which provides easy access to the normal flora from the vagina to the rectum.<sup>2</sup> The moist periurethral areas, where bacteria grow, contribute to a higher urinary colonization rate.<sup>3</sup> About one in five women would have UTI in their lifetime.<sup>2</sup> Women would experience UTIs 10 times more often than men.

Although everyone is vulnerable to UTI, some

subpopulations are particularly at high risk, including pregnant women.<sup>3</sup> The anatomical and hormonal changes that pregnant women experience make them more susceptible to develop UTIs.<sup>4</sup> Pregnancy is one of the risk factors of UTI, considering the weight of the growing fetus in the uterus that causes urinary stasis and ureter vesical reflux.<sup>5,6</sup>

The presence of risk factors increases the chances of UTI. It is recommended that clinicians should regularly examine people with risk factors. They should be promptly treated, and the risk factors should be avoided and treated to prevent the development of recurrent UTI. Considering that pregnancy is a risk factor for UTI plus many others and its complications to both the mother and fetus, this study determined the knowledge, attitude, practices (KAP), and health beliefs of pregnant women about UTI. This study provides baseline data that may be

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used as a basis in the implementation of a health education intervention that would provide pregnant women with better knowledge, positive attitude, good hygienic practices, and strong beliefs necessary in the prevention of UTI.

## Method

This study used an analytic cross-sectional design that examined the KAP and beliefs of pregnant women about UTI based on the Health Belief Model (HBM) constructs. The prevalence of UTI among pregnant women was identified. Correlational analysis was also used to determine the association between the sociodemographic factors and the prevalence of UTI and the KAP of pregnant women. The sample size was calculated using Raosoft sample size calculator (Raosoft Inc., USA) at 95% confidence interval and 5% margin of error. The population size input of 45,802 was based on the total number of eligible pregnant women with at least four prenatal visits in Pampanga, the Philippines, as reported in the Field Health Information System in 2015. A total of 345 pregnant women were included as the target population of the study.

Participants of the study were pregnant women regardless of their gestation age, parity, gravidity, and age. Initially, arrangements were made with the administrative staff of health centers and district hospital to conduct the study during “buntis day,” which is held once a month. The “buntis day” is an initiative of the local government wherein once a month regular check-ups and seminars are being provided to pregnant women. Recruitment of participants was made every week until the target population size was achieved. A structured questionnaire was developed, adapting significant items from the previous studies that investigated pregnant women with UTI.<sup>5,7,8</sup> The questionnaire was translated into the Filipino language for easy understanding of the target respondents. The questionnaire consisted of five parts. The first part contained questions about the sociodemographic profile of the respondents. The second part involved questions about their knowledge of the basic information on UTI and attitude UTI prevention. The third part covered their health practices, including self-hygiene, clothing manners, urination habits, and sexual activity. The fourth part consisted of questions on health beliefs based on HBM constructs that are perceived susceptibility, perceived severity, perceived barriers, perceived benefits, cues to action, and self-efficacy.

Collected data were encoded using Microsoft Excel, and the encoded data were then verified and analyzed using STATA IC Ver. 13.0. Frequency distribution, percentage, and mean were used to represent the prevalence of UTI and the various variables in the study,

namely, the sociodemographic profile, KAP, and the HBM constructs, with weighted data scoring scheme. The association of sociodemographic profile with the occurrence of UTI and baseline KAP of the participants was determined with Pearson’s chi-square test, which was later verified with structural equation modeling.

The Angeles University Foundation - Center for Research and Development Ethics Review Committee (Ref No. 028) approved to conduct the study. Parental consent was sought for participants below 18 years of age. The objectives of the study and the contents of the informed consent/parental consent were explained to the respondents. The study only included those who signified their willingness to participate by signing the form. A total of 24 visits to different rural health units (RHUs) and district hospital from August 2017 to October 2017 were done to gather the data for the total population required. Technical support and instructions were provided to the pregnant women on proper specimen collection for urinalysis. Standard urinalysis was performed in either the health centers or hospital laboratory where the respondents were recruited. The UTI diagnosis was confirmed by the doctors of the health centers and hospital based on the urinalysis and medical examination results, as part of the routine procedures during prenatal check-ups.

## Results

A total of 345 pregnant women from different RHUs and district hospital in Pampanga, the Philippines, were recruited to participate in the study. The prevalence rate observed among pregnant women was 35.94% (124/345). [Table 1](#) shows the sociodemographic characteristics of the respondents, who tested positive and negative for UTI based on the diagnostic procedure of the rural health centers and district hospital covered in the study. It also shows the results of the association test of the sociodemographic variables with the occurrence of UTI among pregnant women significant at  $p\text{-value} < 0.05$ .

The study revealed that UTIs were most common among pregnant women who were 18 to 24 years old (49.20%). The majority of them lived with partners (62.10%) and were high school graduates (73.39%). Of those with UTI, the majority (83.90%) were housewives, belonged to the poor economic status (76.00%), were in their third trimester of gestation (51.61%), were in their second to third pregnancies (45.97%), and had more than one child (40.70%). Among all the sociodemographic factors, educational attainment is almost significantly associated with UTI during pregnancy with a  $p\text{-value}$  of 0.06. [Table 2](#) shows the description of the KAP (personal hygiene) of pregnant women about UTI. A frequency of 267 (77.39%) indicates that most of the

Table 1. Sociodemographic Profile and Association with the Occurrence of Urinary Tract Infection among Pregnant Women

Variables	Category	n = 345		Negative UTI n = 221		Positive UTI n = 124		p-Value
		F	%	F	%	F	%	
Age (years)	< 18	27	16.26	9	3.57	18	14.75	0.24
	18–24	139	40.76	130	51.58	42	34.44	
	25–30	101	29.62	60	23.81	41	33.60	
	> 30	74	21.70	53	21.03	21	17.21	
Civil status	Single	34	9.88	24	10.91	10	8.10	0.09
	Married	119	34.59	85	38.60	34	27.40	
	Separated	6	1.74	3	1.40	3	2.40	
	Live-in	185	53.78	108	49.10	77	62.10	
Educational attainment	Elementary school	39	11.34	31	14.10	8	6.45	0.04*
	High school	230	66.86	139	63.20	91	73.39	
	Higher education	74	21.51	50	22.70	24	19.35	
	None	1	0.29	0	0.00	1	0.81	
Work	Employed/self-employed	47	13.74	27	12.40	20	16.10	0.33
	Housewife	295	86.26	191	87.60	104	83.90	
Socio-economic status	Low income (poor)	251	77.71	163	78.74	88	76.00	0.55
	Middle income	72	22.29	44	21.26	28	24.00	
	Upper income	0	0.00	0	0.00	0	0.00	
Age of gestation (weeks)	< 12 (first trimester)	23	6.74	14	15.38	9	14.06	0.17
	< 28 (second trimester)	163	47.80	112	51.61	51	41.13	
	≥ 28 (third trimester)	155	45.45	91	41.94	64	51.61	
Gravidity	First	125	36.55	78	35.78	47	37.90	0.48
	Second and third	150	43.86	93	42.66	57	45.97	
	Fourth +	67	19.59	47	21.56	20	16.13	
Parity	0	129	37.94	80	36.90	49	39.80	0.33
	1	82	24.12	58	26.70	24	19.50	
	> 1	129	37.94	79	36.40	50	40.70	

Notes: UTI= urinary tract infection

Table 2. Knowledge, Attitude, and Practices of Pregnant Women about Urinary Tract Infection

Variable	Category	Frequency	Percentage
		(n = 345)	%
Knowledge	Unsatisfactory	267	77.39
	Satisfactory	76	22.03
Attitude	Negative	16	4.64
	Positive	324	93.91
Preventive practices (personal hygiene)	Poor hygiene practices	4	1.16
	Satisfactory hygiene practices	332	96.23

respondents had unsatisfactory knowledge of UTI. Almost all of the respondents (324; 93.91%) had a positive attitude regarding the prevention of UTI during pregnancy. The majority of the respondents with a frequency of 332 (96.23%) were described to have satisfactory hygienic practices against UTI (Table 2).

The six constructs, namely, perceived susceptibility, perceived severity, perceived benefits, perceived barrier, cues to action, and self-efficacy, are presented in Table 3 with corresponding statements that were rated the highest by respondents, except for perceived barrier (lowest mean), using a Likert scale. As for perceived susceptibility, pregnant women believed that they are prone to UTI and that they had a high likelihood of having the disease because of their present condition with the highest weighted mean of 3.16. The majority of the

respondents agreed that UTI could lead to kidney damage as part of the perceived severity with the highest weighted mean of 3.34. The regular prenatal checkup was the most important among the statements related to perceived benefits with the highest weighted mean of 3.74 as perceived by the respondents.

The majority of the respondents disagreed with the presented statements related to the perceived barrier, indicating that they did not perceive these given situations as barriers to UTI prevention, with the least weighted mean of 1.99 on having to observe good personal hygiene before and after intercourse. For cues to action, respondents strongly agreed that they were most willing to do all necessary actions to prevent UTI with the highest weighted mean of 3.74 on “always follow the advice of the doctor and observance of good personal hygiene.” The weighted mean in self-efficacy indicated that the respondents were confident in their capacity to practice healthy behaviors for a healthy pregnancy and a healthy baby with the highest weighted mean of 3.44.

Table 4 shows the association of the sociodemographic variables with knowledge, attitude, and preventive practices (personal hygiene) of pregnant women. This is to present if the demographics have to do with the level of KAP of the pregnant women regarding UTI. Among the sociodemographic factors, educational attainment and socioeconomic status were found to have

**Table 3. Descriptive of the Health Beliefs with the Highest Weighted Mean Based on Health Belief Model Constructs of the Pregnant Women**

Health Belief Model Construct		Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Interpretation
		n (%)	n (%)	n (%)	n (%)		
Perceived susceptibility	I worry a lot about getting UTI	129 (38.28)	152 (45.10)	39 (11.57)	17 (5.04)	3.16	Agree
Perceived severity	Having UTI can lead to kidney damage	155 (45.99)	150 (44.51)	24 (7.12)	8 (2.37)	3.34	Agree
Perceived benefits	Regular prenatal checkup can help prevent UTI and its complications	257 (76.49)	74 (22.02)	2 (0.60)	3 (0.89)	3.74	Strongly agree
Perceived barriers*	It is very tiring to wash sexual organ before and after intercourse	27 (8.04)	36 (10.71)	180 (53.57)	93 (27.68)	1.99*	Disagree
Cues to action	I always follow the advice of the doctor	241 (71.73)	91 (27.08)	3 (0.89)	1 (0.30)	3.70	Strongly agree
	I observe good personal hygiene like proper washing to prevent UTI	240 (71.43)	92 (27.38)	4 (1.19)	0	3.70	Strongly agree
Self-efficacy	I know that my baby will be healthy upon delivery	171 (50.89)	145 (43.15)	17 (5.06)	3 (0.89)	3.44	Agree

Notes: \*Lowest weighted mean

**Table 4. Association of Sociodemographic Variables with Knowledge, Attitude, and Practices**

Variables	Knowledge	Attitude	Practices
	(p-Value)	(p-Value)	(p-Value)
Age	0.04*	0.51	0.98
Civil status	0.18	0.36	0.78
Educational attainment	<0.001*	0.20	0.57
Work	0.57	0.10	0.42
Age of gestation	0.53	0.78	0.47
Gravidity	0.95	0.87	0.15
Parity	0.44	0.77	0.53
Socio-economic status	<0.001*	0.46	0.89

Notes: p-value significant at < 0.05

a significant association with the knowledge of the respondents (p-value < 0.001). None of the other sociodemographic variables showed an association with the attitude and practices of pregnant women.

## Discussion

A prevalence rate of 35.94% (124/345) showed positive UTI among pregnant women, which is comparable with a local study done in Barangay Cubacub Health Center in Mandaue, Cebu City, Philippines, among first-time pregnant women in their first trimester with an occurrence rate of 35%.<sup>9</sup> The high prevalence rate is consistent with the global trend, with median rates between 3% and 35%. The prevalence rate of UTI among pregnant women in the current study was high, considering that it was in the higher range limit of 35% based on the study done by Gilbert *et al.*<sup>1</sup>

Most of the pregnant women included in the study were housewives aged between 18 and 24 years and were those with the highest prevalence of UTI among the age groups. It is noteworthy to mention that the youngest pregnant woman covered in the study was 12 years old,

and the percentage of respondents aged 18 years old and below was 16.26%. There was a shallow frequency of the respondents with 12 weeks of gestation covered in the study, showing that pregnant women would not submit themselves to prenatal check-ups as early as the first trimester of pregnancy. More than half of the respondents (53%) were with live-in partners, a variable that most related studies did not cover. The sociodemographic profile of the respondents in the current study is consistent with the 2013 National Demographic and Health Survey report regarding early pregnancy and motherhood with low elementary education and in the lowest wealth status among Filipino women. The report also indicated that the initiation of a sexual act before the age of 18 years among young women was more common in those with less education and those from poorer households.<sup>10</sup>

None of the sociodemographic variables showed a significant association with the occurrence of UTI among pregnant women; however, educational attainment showed an almost significant association with a p-value of 0.057. The current study showed that sociodemographic profile had nothing to do with UTI as most studies would report. UTIs are commonly seen among pregnant women with the same sociodemographic variables as with age, education, and socio-economic level in the studies of Sadeghi *et al.*,<sup>7</sup> and Emiru *et al.*,<sup>5</sup> but discordant with other variables like gravidity (first pregnancy) and parity (no child) in the study of Dimetry *et al.*<sup>11</sup>

Sociodemographic variables like age, education, employment status, and gravidity did not show significant association with the prevalence of UTI similar to the results of the current study; however, health behaviors like clothing manners, eating patterns, urinating habits,



and cleaning and sexual behaviors were found to have a significant association with urinary infection.<sup>6,8</sup> In the current study, the association of hygienic practices and prevalence of UTI was not covered.

The majority of the respondents had unsatisfactory knowledge of UTI with a positive attitude and satisfactory hygienic practices regarding the prevention of UTI during pregnancy. A local study on the awareness level and occurrence rate of UTI among pregnant women showed a significant association. The awareness level on UTI's definition was high, causes moderate, risk factors moderate, symptoms high, and prevention high.<sup>9</sup> A study on the prevention of genitourinary tract infection (GUTI) of female adolescent students revealed the same results with the current study, with unsatisfactory knowledge on the necessary information on GUTI, including its causes, symptoms, and complications.<sup>12</sup> Another study, conducted among 110 pregnant women in Behbahan City in Iran, revealed that the knowledge, attitude, and health behavior in the prevention of UTI were moderate in the description.<sup>13</sup> The unsatisfactory knowledge of the respondents is likely because of their low level of education. The questions regarding knowledge are highly facts based and technical, which were not known to the majority of them.

The study revealed that the respondents had a positive attitude about learning more about UTI, which is a very appropriate description of their unsatisfactory knowledge. However, their satisfactory hygienic practices for UTI prevention did not align with their unsatisfactory knowledge. This finding might be due to the typical optimistic outlook in life of most Filipino people and their willingness to learn more about UTI and its prevention. Practices were described to be of satisfactory hygiene practices, which means that they might not know all the facts theoretically, but they are already practicing them.

The majority of the respondents perceived themselves to be susceptible to UTI, with kidney damage as the most severe complication. They believed that regular prenatal check-up was the most beneficial action to prevent UTI during pregnancy. They did not perceive the presented barriers as obstacles to preventive practices. The respondents are most willing to take action and are confident of healthy pregnancy despite their sensitivity to UTI. It was suggested that a qualitative exploration of perceived barriers be done based on a study among female college students for breast cancer screening. Similar to the current study, counseling was done to extract perceived barriers about UTI prevention, as variables listed in the survey questionnaire may not cover the minority population.<sup>14</sup> A total of 68 individuals underwent counseling, and 12 of them were husbands of pregnant women.

A percentage of 38% claimed that they did not experience any difficulty in following preventive practices against UTI. Some of the noted barriers that inhibited them from following preventive practices like drinking adequate water were heavy household chores, stress in taking care of the other children, feeling bloated from so much drinking of water, non-availability and inaccessibility of water, and preference of flavored beverages than water because of taste. Others described that their diet contained processed food like chips and soda because these are readily available. Many pregnant women mentioned that their fruit consumption is very minimal because of the high cost. None of them indicated a barrier regarding personal hygiene like the washing of genitalia and sexual activity because perhaps these are sensitive issues, and they would not like to divulge some privacy issues. It is noteworthy to mention that some of the respondents directly addressed the barriers into a positive viewpoint and said that they needed to take care of themselves because their husband or partner was working abroad or far-flung areas. Otherwise, if they got sick, nobody would take care of them. Most of the related studies in HBM did not show the description of the individual constructs of the respondents.

The HBM constructs with the lowest weighted score was perceived barrier, and the one with the highest weighted score was cues to action, which vividly shows the resilience of typical Filipinos, in which many will remain to be positive and hopeful despite some obstacles and are determined to achieve their goals no matter how impossible they may seem.

Educational attainment and socioeconomic status were found to have a significant association with the unsatisfactory level of knowledge of the respondents. The majority of the respondents' low level of education contributed a lot to their unsatisfactory knowledge. Being poor, on the other hand, was a critical factor for the noncompletion of their education. The details about UTI covered in the survey tool in the knowledge part were highly fact based. The reason for the unsatisfactory scores in the knowledge part was likely due to a lack of formal schooling. None of the sociodemographic variables showed an association with the positive attitude and satisfactory hygienic practices of pregnant women. Considering that their sociodemographic profile is typical of the underprivileged, their positive attitude and satisfactory hygienic practices still placed them at an advantaged position. In a study conducted among women of low economic status about pregnancy-related risk factors, it was shown that despite the strong knowledge base, high risk behaviors and conditions existed. Knowledge alone is not enough to change behavior.<sup>15</sup>

In general, there is a high prevalence of UTI among pregnant women, consistent with global and local statistics, similar to the upper range limit of the global figures. The demographic profile of the respondents is typical of the underprivileged, with the majority of them having completed only high school education and belonging to the low socioeconomic status, which is considered poor. The respondents have a positive attitude and satisfactory hygienic practices on UTI prevention despite their unsatisfactory knowledge about UTI. Respondents' health beliefs based on the HBM constructs are outstanding and vividly depict the traits of the Filipino people of having an optimistic outlook on life despite the difficulty.

## Conclusion

Considering the pregnant women's positive attitude and satisfactory hygienic practices about UTI prevention despite the unsatisfactory level of knowledge, it is recommended to regularly conduct a mother's class that includes a discussion on UTI and its causes, signs, symptoms, and complications. At present, a regular mother's class is being done in RHUs and district hospitals as part of the Department of Health's maternal and child care program. However, the class only typically includes topics such as the importance of attending prenatal and postnatal check-ups, birthing, breastfeeding, newborn screening, and promoting the department's programs. UTI and its prevention among pregnant women are not substantially covered in the mother's class.

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